

Name: \_\_\_\_\_ Class: \_\_\_\_\_ Due Date: \_\_\_\_\_

When solving the following problem, be sure to:

- 1) Restate the question
- 2) State your answer in a complete sentence.
- 3) List facts and important information
- 4) Explain your solution strategy and include your calculations/work.

### ***POW Letter Jackets***

A small 8-person company creates hand-made jackets with school names and colors. It offers a basic jacket with the school logo, and a deluxe model with leather sleeves and more trim. The company gets a lot of business in March with the college basketball tournament taking place.

Making a basic jacket involves one hour of cutting and two hours of sewing. Making a deluxe jacket involves two hours of cutting and three hours of sewing. All employees work 8 hours a day. Three of the employees do the cutting, so there are 24 hours of labor available for cutting each day. The other five employees do the sewing, so there are 40 hours of labor available for sewing each day.



If the profit on each basic jacket is \$40 and the profit on each deluxe one is \$70, how many of each kind should the company make each day in order to maximize the profit?

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**Note:** This problem can be solved using a process known as *linear programming*. If you aren't familiar with that technique, you can read this answer from our Ask Dr. Math service to get help:

<http://mathforum.org/library/drmath/view/66386.html>

**Bonus:** Explain the concept behind linear programming (not the proof) and give an example of how you might use it in your life.

Please answer the problem on a separate piece of paper. You must include all your calculations and an explanation of how you got your answer. Your paper will be scored in the following way:

- 4 The answer and the bonus are correct, you have included all your calculations, and the explanation is thorough and understandable.
- 3 The answer is correct, you have included all your calculations, and the explanation is complete and clear to the reader.
- 2 The answer is missing one of the items mentioned above.
- 1 The answer is incorrect, and the explanation or calculations are poor or missing.
- 0 Minimal or no effort was made to solve the problem.
- All late work is marked down a grade.
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